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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,876	10/20/2003	Shanna D. Knights	12622US03	3902

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EXAMINER

YUAN, DAH WEI D

ART UNIT PAPER NUMBER

1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/689,876

Applicant(s)

KNIGHTS ET AL.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 and 16-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>02112004</u> . | 6) <input type="checkbox"/> Other: _____ |

**SUPPORTED CATALYSTS FOR THE ANODE OF A VOLTAGE REVERSAL
TOLERANT FUEL CELL**

Examiner: Yuan

S.N. 10/689,876

Art Unit: 1745

January 3, 2007

Election/Restrictions

1. Applicant's election without traverse of Group I-4, claims 10-15, in Paper filed December 4, 2006 is acknowledged. Therefore, claims 1-9,16-21 are withdrawn from consideration.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Fung et al. (US 4,131,721).

Fung et al. teach a fuel cell comprising an anode, a cathode, and an electrolyte, wherein graphitized carbon is used as the anode support. See Column 4, Lines 16-35. Fung et al. do not specifically disclose the relative oxidative corrosion of the graphitized carbon. However, it is the position of the examiner that such properties are inherent, given that both Fung et al. and the present application utilize the same anode support. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 11-13, Fung et al. do not specifically disclose the d_{002} spacing and the BET surface area of the graphitic carbon. However, it is the position of the examiner that such properties are inherent as evidenced by Takei et al., wherein the graphitic carbon has a specific surface area of $50 \text{ m}^2/\text{g}$ or more and an average interlaminar spacing (d_{002}) of 3.35 to 3.42 \AA . See Takai et al. (US 5,096,560), Column 5, Lines 15-22.

4. Claims 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Marchetti et al. (US 5,277,996).

Marchetti et al. teach a fuel cell comprising an anode, a cathode, and an electrolyte, wherein graphitized carbon is used as the anode support. See Column 3, Lines 7-20. Marchetti et al. do not specifically disclose the relative oxidative corrosion of the graphitized carbon. However, it is the position of the examiner that such properties are inherent, given that both Marchetti et al. and the present application utilize the same anode support. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 11-13, Marchetti et al. do not specifically disclose the d_{002} spacing and the BET surface area of the graphitic carbon. However, it is the position of the examiner that such properties are inherent as evidenced by Takei et al., wherein the graphitic carbon has a specific surface area of $50 \text{ m}^2/\text{g}$ or more and an average interlaminar spacing (d_{002}) of 3.35 to 3.42 \AA . See Takai et al. (US 5,096,560), Column 5, Lines 15-22.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bregoli et al. (US 4,810,594) in view of Fung et al. (US 4,131,721).

Bregoli et al. discloses a fuel cell comprising an anode, a cathode, and an electrolyte, wherein graphitized carbon is used as the cathode support. See Column 3, Line 65 to Column 4, Line 7. Bregoli et al. do not teach the use of the graphitized carbon as the anode support. Fung et al. teach the graphitized carbon is particularly suited for long-term use as cathode electrode. Nevertheless, it may also be used as anode electrode. See Column 4, Lines 16-31. Therefore, it would have been obvious to one of ordinary skill in the art to use the graphitized carbon as the anode support onto the fuel cell of Bregoli, because Fung et al. teach the graphitized carbon can be used as the anode support as well as the cathode support in a fuel cell.

Moreover, Bregoli does not specifically disclose the relative oxidative corrosion of the graphitized carbon. However, it is the position of the examiner that such properties are inherent, given that both Bregoli et al. and the present application utilize the same anode support. A reference which is silent about a claimed invention's features is inherently anticipatory if the

missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 11-13, Bregoli et al. do not specifically disclose the d_{002} spacing and the BET surface area of the graphitic carbon. However, it is the position of the examiner that such properties are inherent as evidenced by Takei et al., wherein the graphitic carbon has a specific surface area of $50 \text{ m}^2/\text{g}$ or more and an average interlaminar spacing (d_{002}) of 3.35 to 3.42 \AA . See Takai et al. (US 5,096,560), Column 5, Lines 15-22.

7. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fung et al. (US 4,131,721) as applied to claims 10-13 above, and further in view of Takai et al. (US 5,096,560).

Fung et al. disclose a fuel cell as described above in Paragraph 3. However, Fung et al. do not specifically teach the BET surface area of the graphitic carbon is about $86 \text{ m}^2/\text{g}$. Takai et al. teach the fabrication of graphitic carbon, wherein the heat treatment is carried out at a temperature of 800° to 3000°C in a non-oxidizing atmosphere for 5 to 20 hours. See Column 5, Lines 1-12. Therefore, it would have been within the skill of the ordinary artisan to fabricate a graphitic carbon having a BET surface area of about $86 \text{ m}^2/\text{g}$, because Takai et al. teach a particular physical characteristic of the resulting graphitic carbon power can be achieved by modifying the time and temperature of the heat treatment. *Discovery of optimum value of result effective variable in known process is ordinarily within skill of art*. In re Boesch, CCPA 1980, 617 F.2d 272, 205 USPQ215.

8. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marchetti et al. (US 5,277,996) as applied to claims 10-13 above, and further in view of Takai et al. (US 5,096,560).

Marchetti et al. disclose a fuel cell as described above in Paragraph 4. However, Marchetti et al. do not specifically teach the BET surface area of the graphitic carbon is about 86 m²/g. Takai et al. teach the fabrication of graphitic carbon, wherein the heat treatment is carried out at a temperature of 800° to 3000°C in a non-oxidizing atmosphere for 5 to 20 hours. See Column 5, Lines 1-12. Therefore, it would have been within the skill of the ordinary artisan to fabricate a graphitic carbon having a BET surface area of about 86 m²/g, because Takai et al. teach a specific surface area of the resulting graphitic carbon power can be achieved by modifying the time and temperature of the heat treatment. *Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. In re Boesch*, CCPA 1980, 617 F.2d 272, 205 USPQ215.

9. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bregoli et al. (US 4,810,594) and Fung et al. (US 4,131,721) as applied to claims 10-13 above, and further in view of Takai et al. (US 5,096,560).

Bregoli et al. and Fung et al. disclose a fuel cell as described above in Paragraph 6. However, Bregoli and Fung do not specifically teach the BET surface area of the graphitic carbon is about 86 m²/g. Takai et al. teach the fabrication of graphitic carbon, wherein the heat treatment is carried out at a temperature of 800° to 3000°C in a non-oxidizing atmosphere for 5

to 20 hours. See Column 5, Lines 1-12. Therefore, it would have been within the skill of the ordinary artisan to fabricate a graphitic carbon having a BET surface of about $86 \text{ m}^2/\text{g}$, because Takai et al. teach the physical characteristic of the resulting graphitic carbon power can be achieved by modifying the time and temperature of the heat treatment. *Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. In re Boesch*, CCPA 1980, 617 F.2d 272, 205 USPQ215.

10. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fung et al. (US 4,131,721) as applied to claims 10-13 above, and further in view of Joshi et al. (US 5,681,435).

Fung et al. teach a fuel cell stack comprising anodes, cathodes and electrolyte as described in Paragraph 3. However, Fung et al. do not teach the incorporation of Ti_4O_7 into the carbon support. Joshi et al. teach the inclusion of Ebonex (a conductive Ti_4O_7 material) in the anode structure of precious metal oxide and graphite support, because it prevents the decay in performance of the anode. See Column 4, Line 51 to Column 5, Line 11. Therefore, it would have been obvious to one of ordinary skill in the art to add Ti_4O_7 material in the anode structure of a fuel cell stack of Fung et al., because Joshi et al. teach the addition of Ti_4O_7 can improve the performance of the anode in a fuel cell system.

11. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marchetti et al. (US 5,277,996) as applied to claims 10-13 above, and further in view of Joshi et al. (US 5,681,435).

Marchetti et al. teach a fuel cell stack comprising anodes, cathodes and electrolyte as described in Paragraph 4. However, Marchetti et al. do not teach the incorporation of Ti_4O_7 into the carbon support. Joshi et al. teach the inclusion of Ebonex (a conductive Ti_4O_7 material) in the anode structure of precious metal oxide and graphite support, because it prevents the decay in performance of the anode. See Column 4, Line 51 to Column 5, Line 11. Therefore, it would have been obvious to one of ordinary skill in the art to add Ti_4O_7 material in the anode structure of a fuel cell stack of Marchetti et al., because Joshi et al. teach the addition of Ti_4O_7 can improve the performance of the anode in a fuel cell system.

12. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bregoli et al. (US 4,810,594) in view of Fung et al. (US 4,131,721) as applied to claims 10-13 above, and further in view of Joshi et al. (US 5,681,435).

Bregoli and Fung teach a fuel cell stack comprising anodes, cathodes and electrolyte as described in Paragraph 6. However, Bregoli and Fung do not teach the incorporation of Ti_4O_7 into the carbon support. Joshi et al. teach the inclusion of Ebonex (a conductive Ti_4O_7 material) in the anode structure of precious metal oxide and graphite support, because it prevents the decay in performance of the anode. See Column 4, Line 51 to Column 5, Line 11. Therefore, it would have been obvious to one of ordinary skill in the art to add Ti_4O_7 material in the anode structure of a fuel cell stack of Bregoli and Fung, because Joshi et al. teach the addition of Ti_4O_7 can improve the performance of the anode in a fuel cell system.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
January 3, 2007



DAH-WEI YUAN
PRIMARY EXAMINER